NOAA Technical Report: Periwinkle Recruitment

Steven C. Pennings[1*], Scott Zengel[2], Jacob Oehrig[3]

1. Department of Biology and Biochemistry, University of Houston, Houston, Texas 77204, United States

2. Research Planning, Inc. (RPI), Tallahassee, Florida 32303, United States

3. NewFields, Atlanta, GA 30309, United States

* spennings@uh.edu. Telephone 713 743 2989

Abstract

Marine species with planktonic larvae often have high spatial and temporal variation in recruitment that leads to subsequent variation in the ecology of benthic adults. Using a combination of literature and unpublished data, we compared the population structure of the salt marsh snail, *Littoraria irrorata*, in Louisiana, between three time periods to evaluate the hypothesis that the *Deepwater Horizon* oil spill led to widespread recruitment failure of *L. irrorata* in Louisiana in 2010. Size-frequency distributions were bimodal, with a trough in the distribution consistent with a transition from sub-adults to adults at ~13 mm in shell length as reported in the literature. The ratio of sub-adults to adults in Louisiana was lower in 2011 than in previous years, and began to recover in 2012-2014, consistent with widespread recruitment failure in 2010, when large expanses of spilled oil were present in coastal waters. Our results suggest that the *Deepwater Horizon* oil spill may have caused widespread recruitment failure in this species and perhaps others with similar planktonic larval stages.

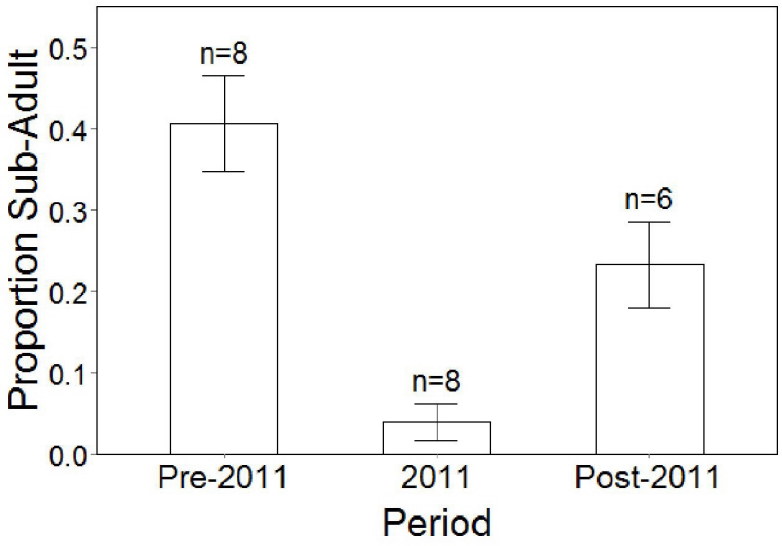

Figure 1. The proportion of sub-adult *L. irrorata* snails in Louisiana during three time periods. All data are from sites that showed little or no visual evidence of oiling from the *Deepwater Horizon* oil spill. Numbers above bars indicate the number of data points (each point represents a single site-year) for each time period; error bars indicate 1 standard error. The time periods are significantly different (Kruskal-Wallis, $P<0.001$), and 2011 is significantly different from the pre-2011 time period (Dunn posthoc pairwise tests, $P<0.005$) but not from the post-2011 time period (Dunn posthoc pairwise tests, $P=0.08$).